TECHNICAL REVIEW DOCUMENT
For
MODIFICATION TO OPERATING PERMIT 95OPMR010

Colorado Interstate Gas Company – Ft. Morgan Compressor Station
Morgan County
Source ID 0870003

Prepared by Jacqueline Joyce
June 3 - 5, 2003
Revised August 5, 2003 based on comments made by EPA during their 45-day review
Revised January 23, 2004 to increase emission limits for new engine
Revised August 11, 2004 to address EPA applicability letter received June 28, 2004

I. Purpose:

This document establishes the decisions made regarding the requested modifications to the Operating Permit for the Ft. Morgan Compressor Station. This document provides information describing the type of modification and the changes made to the permit as requested by the source and the changes made due to the Division's analysis. This document is designed for reference during review of the proposed permit by EPA and for future reference by the Division to aid in any additional permit modifications at this facility. The conclusions made in this report are based on the information provided in the original request for modification submitted to the Division on May 13, 2003, additional information submitted on January 12 and 23, 2004, various e-mail correspondence and telephone conversations with the source. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

II. Description of Permit Modification Request/Modification Type

The renewal operating permit for the Ft. Morgan Compressor Station was issued on April 1, 2002. CIG submitted a request on May 13, 2003 to modify the operating permit and add a new 1,151 hp compressor engine. In their request the source indicated that the modification met the requirements for a minor permit modification and requested that the modification be processed under the minor modification procedures in Colorado Regulation No. 3, Part C, Section X. The source requested emissions based on

manufacturer's emission factors and 8760 hrs/yr of operation. Requested emissions for this engine are below the PSD significance levels.

Colorado Regulation No. 3, Part C, Section X.A identifies those modifications that can be processed under the minor permit modification procedures. Specifically, minor permit modifications "are not otherwise required by the Division to be processed as a significant modification" (Colorado Regulation No. 3, Part C, Section X.A.6). The Division requires that "any change that causes a significant increase in emissions" be processed as a significant modification (Colorado Regulation No. 3, Part C, Section I.B.36.h.(i)). Since requested emissions are below PSD significance levels, the Division agrees that this modification qualifies as a minor modification.

III. Modeling

The Division's modeling guidance identifies modeling thresholds and typically no modeling is required for those projects with requested emissions below the modeling threshold. However, the Division's modeling guidance also indicates that in some cases modeling is warranted even though the requested emissions are below the modeling threshold, when it is reasonable to believe that the source will cause or contribute to a violation of the ambient air quality standards in circumstances such as modifications at existing major stationary sources that have never been modeled before. The Ft. Morgan Compressor Station is a major stationary source with the potential to emit, prior to the addition of the proposed engine, of over 500 tons/yr of NO_X and 800 tons of CO. Prior to submitting the modification, the Division had indicated to CIG that cumulative modeling would be required for the facility, since it has never been modeled. The Division considers that in this case, with the high potential to emit of NO_X emissions and since the facility has never been modeled, there is reason to believe that the facility could cause or contribute to a violation of the ambient NO_X standards. Although the potential to emit of CO is almost twice as high as that of NO_X, the Division does not believe modeling for CO is necessary, since the CO ambient standards are 2 orders of magnitude higher than the NO_X standards and we think it unlikely that the CO emissions from the facility would cause or contribute to violations of the CO ambient standards. Therefore, the source conducted a cumulative modeling analysis for NO_X emissions. Based on the modeling conducted, with current stack parameters, the modeling analysis indicated potential violations of the NO_2 (75% conversion from NO_X to NO_2) standard at locations just beyond the northern and eastern property boundaries, which suggested the high concentrations were due to building downwash.

Therefore, CIG conducted modeling at various stack height combinations and found that if the stacks for Units CG-01, 02, 07, 08 and 09 were raised to 36 feet, the stacks for Units CG-10 and 11 are raised to 41 feet, and the Unit CG-12 (new engine) stack is 41 feet, no violations of the NO_2 standards are predicted. CIG has committed to complete the revisions to the existing stacks by November 15, 2003. The Division has reviewed the modeling and agrees that with the revised stack heights, the facility and the requested minor modification do not cause or contribute to a violation of the NAAQS

and CAAQS. The impacts of the facility and proposed modification (new engine), with the new stack heights, are as follows:

Pollutant	Averaging Time	Facility	Facility and Nearby Sources	Background Concentration	Total Impact
NO_2*	Annual	43.1 µg/m^3	43.3 µg/m^3	7.5 µg/m^3	50.8 µg/m^3

*75% conversion from NO_X to NO_2.

The commitment to increase the stack heights will be included in the operating permit.

IV. Discussion of Modifications Made

Source Requested Modifications

The Division addressed the source's requested modifications as follows:

Compliance Schedule

As discussed above under the modeling section, the Division will include CIG's commitment to raise the stack heights for engines CG-01, 02, 07, 08 and 09 and CG-10 and 11 by November 15, 2003. In addition, upon installation, the stack height for CG-12 (new engine) will be 41 feet. The commitment to increase the stack heights is a schedule for the source to reach compliance with the NO_2 NAAQS. Although the November 15, 2003 deadline is approximately 6 months from submittal of the minor modification application (May 13, 2003), the Division believes that it is appropriate for the source to submit a status report. Therefore, the permit will require that a status report be submitted by September 1, 2003. The next annual compliance certification submitted (for the period ending December 31, 2003) shall permit will serve as the compliance indicator that the stack height changes have been completed by the specified date.

Semi-Annual Monitoring Periods and Annual Compliance Periods

Although not specifically indicated in their modification request, for other permits, the permit contact has requested that the reporting periods be based on the calendar year in the renewal operating permits. The permit contact made this decision after issuance of the renewal permit for this facility. The Division included a schedule in the proposed operating permit to get the report and compliance certification due dates on a calendar year schedule. The source never opted to follow the report and compliance certification schedule in the proposed permit, therefore, the final issued permit reflects no change in the report and compliance certification due dates. The due dates are the same as provided in the renewal permit issued on April 1, 2002.

Use of In-Line Gas Chromatograph to Determine the Btu Content of the Gas

Again, although not specifically indicated in their modification request, for other permits, the source has requested that they be permitted to use an in-line gas chromatograph in lieu of semi-annual sampling to determine the Btu content of the gas. The request to allow the use of the in-line gas chromatograph was initially made after the issuance of the Ft. Morgan renewal permit, however, at this time, the Division will revise the permit to include the language for using the in-line gas chromatograph or semi-annual sampling to determine the Btu content of the gas.

New Engine, CG-12

The source requested that approval be given to install and operate the following engine:

Unit E008/CG-12, Caterpillar Model No. G3516LE, 4-cycle, turbocharged engine, with low NO_X design, rated at 1151 hp. The engine has a maximum fuel design rate of 8.53 mmBtu/hr and a design heat rate of 7414 Btu/hp-hr.

Applicable Requirements - CIG has requested that the Division approve the construction and operation of this engine. Since the source has requested that this engine be processed as a combined construction/operating permit using the minor modification procedures in Reg 3, Part C, Section X, no construction permit will be issued and all applicable requirements will be incorporated directly into the operating permit with this modification. The applicable requirements for this unit are as follows:

- Opacity of emissions shall not exceed 20% (Reg 1, Section II.A.1)

  Note that no condition is included for the Reg 1 30% opacity standard, which is applicable during certain operating activities. The specific activities under which the 30% opacity standard applies are: building a new fire, cleaning of fire boxes, soot blowing, startup, any process modification, or adjustment or occasional cleaning of control equipment. Based on engineering judgment the Division considers that building a new fire, cleaning of fire boxes and soot-blowing does not apply to the operation of internal combustion engines. In addition, this engine does not have a control device, so adjustment or occasional cleaning of control devices do not apply to this engine. Process modifications and startup may apply to engines, however, based on engineering judgment, the Division believes that such activities would be unlikely to occur for longer than six minutes. Therefore, the 30% opacity requirement has not been included in the operating permit.

- Natural Gas consumption shall not exceed 83.1 mmscf/yr (as requested by APEN submitted May 13, 2003).

  Note that in the APEN submitted on May 13, 2003 and the revised APEN submitted on January 23, 2004, the source requested an annual fuel consumption rate of 78,840 mmBtu/yr. In their draft permit and Title V permit application forms, the source indicated an annual fuel consumption limit of 83.1

mmSCF/yr. This is based on a natural gas heat content of approximately 950 Btu/SCF.

- Emissions of air pollutants shall not exceed the following limitations (as requested by APEN submitted May 13, 2003):

  - NO_X 16.7 tons/yr
  - CO 20.0 tons/yr
  - VOC 5.6 tons/yr

  Issuance of the final permit for this modification was delayed in order to receive a written determination from EPA on the applicability of NSPS Subpart KKK to this new compressor. Prior to issuance, the source requested that the emission limits be based on manufacturer's emission factors plus a cushion of 33% to the NO_X and CO factors and about 40% to the VOC factor. The requested emissions (based on APEN received January 23, 2004) are as 22.2 tons/yr (NO_X), 7.4 tons/yr (VOC) and 26.7 tons/yr (CO). The higher requested emissions do not cause or contribute to a violation of the NAAQS and CAAQS. The adjusted total impacts at the higher requested emissions is 65 $\mu g/m^3$. Note that this is a conservative estimate determined by increasing facility impacts by 33% (the requested increase in emissions for the new engine).

  Note that since this engine is a true minor source, the Division does not require that monthly emission and fuel consumption limits be imposed on this source for the first year of operation as this requirement only applies for major or synthetic minor sources.

- Construction of this source must commence within 18 months of initial approval permit issuance date or within 18 months of date on which such construction or activity was scheduled to commence as stated in the application (Reg 3, Part B, Section IV.G.4.a.(i) thru (ii)).

- Within 180 days after commencement of operation, compliance with the conditions contained on this permit shall be demonstrated to the Division (Reg 3, Part B, Section IV.H.2).

- The permittee shall notify the Division, in writing, thirty (30) days prior to startup (Reg 3, Part B, Section IV.H.1).

<u>Compliance Assurance Monitoring Requirements</u>

Although this engine is equipped with low NO_X design combustion chambers, this is not considered a control device as passive control measures that act to prevent pollutants from forming are not considered control devices under the provisions of 40 CFR Part 64. Therefore, the Compliance Assurance Monitoring (CAM) requirements (40 CFR Part 64, as adopted by reference in Colorado Regulation No. 3, Part C, Section XIV) do not apply to any of this engine.

MACT Requirements

Under the federal Clean Air Act (the Act), EPA is charged with promulgating maximum achievable control technology (MACT) standards for major sources of hazardous air pollutants (HAPs) in various source categories by certain dates. Section 112(j) of the Act requires that permitting authorities develop a case-by-case MACT for any major sources of HAPs in source categories for which EPA failed to promulgate a MACT standard by May 15, 2002. These provisions are commonly referred to as the "MACT hammer".

Owners or operators that could reasonably determine that they are a major source of HAPs which includes one or more stationary sources included in the source category or subcategory for which the EPA failed to promulgate a MACT standard by the section 112(j) deadline were required to submit a Part 1 application to revise the operating permit by May 15, 2002. CIG submitted a Part 1 application for the facility by the May 15, 2002 and indicated that the facility was major for HAPs and identified the "reciprocating internal combustion engine" as a category for which the 112(j) requirements apply and therefore, the Division considered that no Part 1 application was required for the engine. The Part 1 notification indicated that the facility was major for HAPS based on glycol dehydrator HAP emissions at "allowable", not the special provisions for calculating emissions under the Natural Gas Transmission and Storage MACT (40 CFR Part 63 Subpart HHH). The engine itself is not a major source for HAPS, so the case-by-case MACT requirements in 112(g) do not apply.

Although the Part 1 submittal indicates that the facility is major for HAPS, since the Part 1 application specified that the major source status is based on the glycol dehydrator HAP emissions at "allowable", rather than the specific procedures in 40 CFR Part 63 Subpart HHH, the Division considered that the facility was a minor source of HAPS for purposes of applicability to the provisions in 40 CFR Part 63 Subpart HHH.

NSPS KKK

During their 45-day review period, EPA submitted comments to the Division indicating that the technical review document was not clear as to whether the compressor was subject to the requirements in 40 CFR Part 60 Subpart KKK (NSPS KKK). The Division did not consider NSPS KKK initially, but based on EPA's comment we agreed that the NSPS KKK requirements applied. The source did not agree that NSPS KKK applied and requested a formal applicability determination from the EPA. The Division sent a letter on August 14, 2003 to EPA Regions 8 requesting a formal applicability determination. As requested by the source, the Division agreed to hold off issuing the final permit until EPA made a formal applicability determination. The Division received a an applicability determination from EPA on June 28, 2004 (see attached) indicating that the facility is not a "natural gas processing plant" and that NSPS KKK requirements do not apply to this facility.

Emission Factors – Emissions from these reciprocating engines are produced during the combustion process, and are dependent upon the air to fuel ratio adjustment,

specific properties of the natural gas burned, and engine design specifications. The pollutants of concern are Nitrogen Oxides (NO_X), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. Approval of emission factors is necessary to monitor compliance with the emission limitations. The source has proposed to use the following emission factors.

Pollutant	Emission Factor	Source	Converted Emission Factor
NO_X	2 g/hp-hr	Manufacturer's data plus 33%	0.59 lbs/mmBtu
CO	2.4 g/hp-hr	Manufacturer's data plus 40%	0.71 lbs/mmBtu
VOC[1]	0.7 g/hp-hr	Manufacturer's data plus 3%	0.21 lbs/mmBtu

[1]15% of manufacturer's UHC emission factor

The manufacturer's emission factors have been converted to the units of lbs/mmBtu using the following equation and are included in the operating permit:

$$\text{EF (lbs/mmBtu)} = \frac{\text{EF (g/hp-hr)} \times 10^6 \text{ Btu/mmBtu}}{\text{Heat Rate (Btu/hp-hr)} \times 453.6 \text{ g/lb}}$$

The converted emission factors are based on engine design heat rate of 7414 Btu/hp-hr.

EPA's Compilation of Emission Factors (AP-42), Section 3.2, Table 3.2-2, dated July 2000 identifies emission factors for 4-cycle low NO_X engines, as follows: NO_X – 4.08 lbs/mmBtu (90 – 105% load), CO 0.557 lbs/mmBtu (90-105% load) and VOC – 0.118 lbs/mmBtu. The source's proposed emission factors for CO and NO_X are less conservative than AP-42.

Monitoring Plan – The monitoring requirements for this engine are based on guidance developed by the Division for Internal Combustion Engines as shown on the attached Grid titled "Compliance/Scenario Summary - Gas Fired IC Engines" and are included in Section II.6 of the permit. As indicated by the grid, the source will be required to monitor and record fuel consumption and calculate emissions monthly. In addition, portable monitoring shall be required on a quarterly basis. Since the emission factors for this engine have been converted to units of lbs/mmBtu, semi-annual sampling and analysis of the natural gas burned shall be required to determine the heat content of the gas. Finally, the Division presumes the engine is in compliance with the opacity requirements, in the absence of credible evidence to the contrary, whenever natural gas is used as fuel.

Other Modifications

In addition to the requested modifications made by the source, the Division used this opportunity to include changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct

errors or omissions identified during inspections and/or discrepancies identified during review of this modification.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments on other permits, to the Ft. Morgan Operating Permit with the source's requested modifications.

Page Following Cover Page

Added language specifying that the semi-annual reports and compliance certifications are due in the Division's office and that postmarks cannot be used for purposes of determining the timely receipt of such reports/certifications.

Section I – General Activities and Summary

Conditions 13 and 17 in Condition 1.4 were renumbered to 14 and 18 and Condition 21 in Condition 1.5 was renumbered to 22. The renumbering changes were necessary due to the addition of the Common Provisions requirements in the General Conditions of the permit.

Based on comments made by EPA on another operating permit, the phrase "Based on the information provided by the applicant" was added to the beginning of Condition 4.1 (112(r)).

Removed Condition 4.2 (112(r) certification of risk management plans), since this is included in the annual compliance certification in Appendix C.

Added a "new" Section 7 for case-by-case MACT (i.e. 112(j)).

Corrected AIRS stack number for fugitive VOCs in table in Condition 7.1 ("new" Condition 8.1).

Section II – General

Added the appropriate "CG" numbers to the engines in the table titles.

Section II.3 – 2 Permitted Engines

Added language to Condition 3.1 indicating the basis for converting the manufacturer's emission factors (g/hp-hr) into units of lbs/mmBtu.

Section II.4 – Dehydrators

Corrected comparison criteria for cold separator temperature. The specified temperature should be a maximum value not a minimum value.

Section II.5 – Fugitive Emissions from VOCs

The equation in Condition 5.1 to calculate VOC emissions was revised to indicate that the weight percent VOC shall be used to calculate emissions. Since the emission factors are in lbs/hr, it is appropriate to use weight percent VOC.

Section III – Permit Shield

The citation in the permit shield was corrected. The reference to Part A, Section I.B.43 was changed to Part A, Section I.B.44 and the reference to Part C, Section XIII was changed to Part C, Section XIII.B.

Section IV – General Conditions

Added language from the Common Provisions (new condition 3). With this change the reference to “21.d” in Condition 20 (prompt deviation reporting) will be changed to “22.d”, since the general conditions are renumbered with the addition of the Common Provisions.

Removed the upset and breakdown provisions from Condition 4 (emergency provisions) since they are included in the Common Provisions. Removed the upset and breakdown provisions from Condition 4 (emergency provisions) since they are included in the Common Provisions.

The citation in General Condition 17 (open burning) was revised. The open burning requirements are no longer in Reg 1 but are in new Reg 9. In addition, changed the reference in the text from “Reg 1” to “Reg 9”.

Appendices

Added “Eye Protection with Side Shields” and “Flame Retardant Clothing (“Nomex®”)” to Appendix A under “Required Safety Equipment”.

Added the new engine to the tables in Appendices B and C.

Added the appropriate “CG” numbers to the engines in the tables in Appendices B and C.